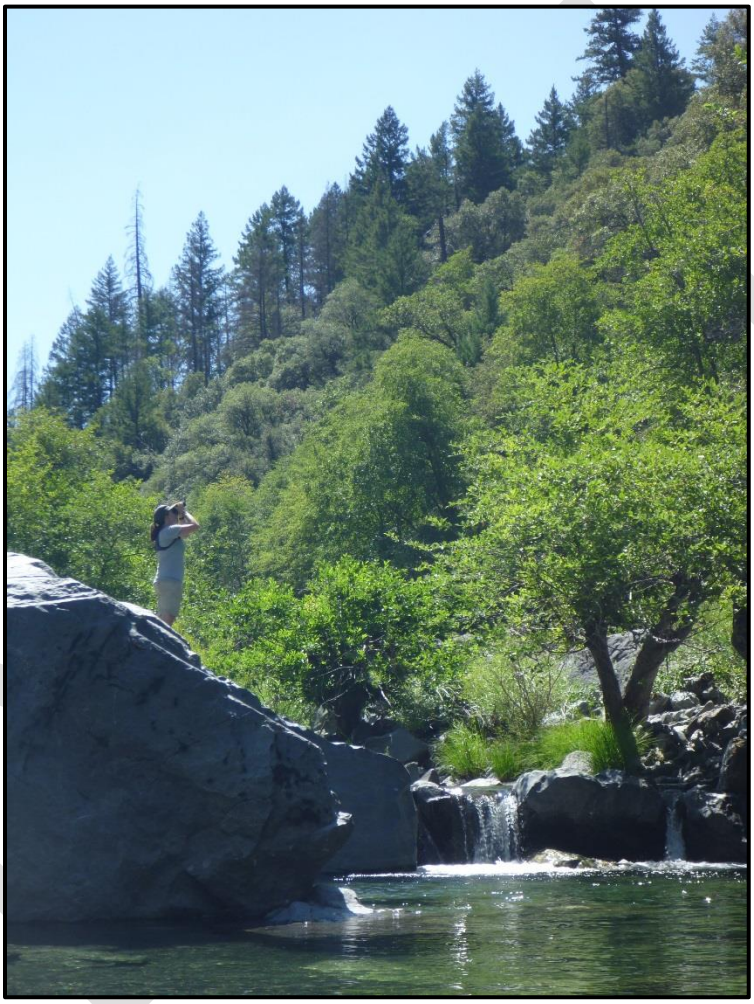
# Black Butte Watershed

# Forestry/Silviculture Report

# For Black Butte Wild and Scenic Plan

**By Tony Saba, Forester, Mendocino NF**



# INTRODUCTION

In 2006, approximately 6579 acres of land within the Black Butte River watershed administered by the Mendocino National Forest was declared as a National Wild and Scenic Waterway. The land dedicated under this policy has significant scenic, scientific, and historic interests, hence the designation.

This designation mainly revolves around the wild character in this section of river, the fishery and its habitat within the river, the rich heritage resources, and geologic values found within this landscape. High water quality and the scenery itself have a close connection with the vegetation within this landscape and the activities related to the vegetation such as wildfire, logging, grazing, etc. Within the last several millennia, vegetation has been manipulated by both native people and settlers in the area. Native people utilized materials from local vegetative cover types for necessities like food, clothing, and shelter and manipulated that vegetation mostly through burning activities.

This report will describe the existing conditions of vegetation alluding to the cover type and dominant species types at a broad scale across the watershed. Many factors have dictated the conditions we see today. Slopes, aspects, soil types, elevations, climate, historic uses (grazing, timber removal, native activities), and the last century of fire suppression are activities that are mainly responsible for existing vegetative structures, species compositions, and density levels.

Data used for measuring existing conditions of grassland, shrubland, and various forest types came from CAL Veg data layer. Classifications from CAL Veg, North Coast Zone 1 geospatial layers cover all of the vegetative types found within the Black Butte watershed boundary. Generally, these layers delineate the aforementioned cover types using obvious breaks in vegetative types, differences in crown closures within and among cover types, canopy layering, dominant species, and size classes of chaparral and forests. Correlations may also be made of the distribution and arrangements of the existing conditions with respect to aspects, slopes, elevations, latitudes, soil types and productivity levels, and plant associations.

The intensity levels of future administrative management activities will vary across this landscape based on the objectives and need for vegetative treatment. This discussion may cover historic activities and discussions may elaborate on trajectories of development of forested stands or grassland areas since those historic activities have taken place.

## Purpose and Need

The purpose of this project is to adopt a comprehensive river management plan to protect and enhance the values for which the river was designated (free-flowing, water quality, and outstandingly remarkable values), and identify and implement Forest Service management actions needed to protect these values within the Black Butte River and Cold Creek corridor. Section 3 of the Wild and Scenic Rivers Act (16 USC 1274, as amended) specifies that a comprehensive management plan will be developed for the designated river corridor.

## Alternative 1 – No Action

Under the No Action alternative, current management plans would continue to guide management of the project area. The corridor boundary would be located approximately ¼ mile from the banks of the river. No additional management strategies would be implemented to accomplish the purpose of the Wild and Scenic River designation. The direction from the Mendocino National Forest Land and Resource

Management Plan, as amended, including direction for Prescription 10 (Wild and Scenic Rivers) and other plans would remain unchanged.

### Alternative 2 – Proposed Action

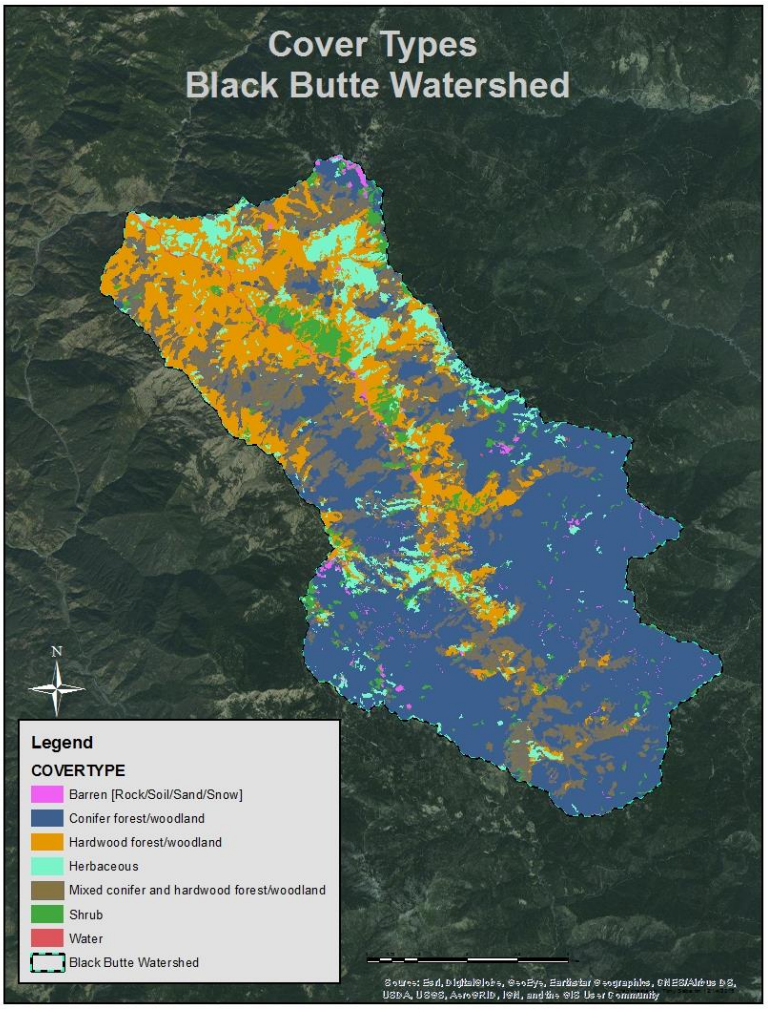
Alternative 2 would recommend a permanent boundary and adopt a comprehensive river management plan (CRMP) to include the Forest Plan Prescription 10 (Wild and Scenic Rivers), Standard and Guidelines for Key Watersheds (which Black Butte is part of) while identifying management strategies and projects to address key issues and achieve purpose of the Wild and Scenic Rivers Act.

The full CRMP can be found under Chapter 4 of the Environmental Assessment.

## EXISTING CONDITIONS

Figures 1 and 2 are depictions of the current vegetative cover types that encompass a wide range of forest, shrub, and grass species compositions. All of the acres with an existing vegetative cover type, private or public lands within the Black Butte Watershed boundary were analyzed; approximately 103,500 acres. Of the five general vegetative cover types located within the Black Butte Watershed boundary, conifer forest communities account for over half. The hardwood and mixed hardwood/conifer are nearly in equal distribution across this landscape, while herbaceous and shrubland cover types account for the least amount of acreage. See figure 2 for a reference of the distribution of cover types relative to percentage and acreage.

**Figure 1. Vegetative Cover Types within the Black Butte Watershed.**




Each of these stand types have more specific stand types consisting of compositions that are dominated by some species and also composed of communities with a more mixed composition, especially within forested and chaparral cover types. These descriptions can be referenced from Society of American Foresters (SAF) or Society of Range Management (SRM) classifications and are ready available within libraries or online. These references give more in-depth insight as to what one may find within these specific species cover types than what this report will delve into. This report will give a general look into what species cover types exist within this landscape, what proportion they are found in across the Black Butte Watershed, and subtle information on how each of them vary from each other.

**Figure 2. Acreage and proportions of vegetative cover types within Black Butte Watershed boundary (private and public lands).**

| Cover Type | ~ Acres in watershed | ~ Proportion in watershed | Acres within corridor | Proportion in corridor |
|---|---|---|---|---|
| Shrubland | 4,394 | 4% | 630 | 10% |
| Mixed Conifer Forest and Hardwood Forest/Woodland | 18,960 | 18% | 1138 | 19% |
| Conifer Forest/Woodland | 50,383 | 49% | 490 | 8% |
| Hardwood Forest/Woodland | 20,943 | 21% | 3205 | 52% |
| Herbaceous | 7,952 | 8% | 693 | 11% |

## Shrubland Component

These cover types consist of a variety of species types with a wide range of diversity. Generally, the shrub cover types can be classified into 4 species types: scrub oak mixed chaparral, montane shrubland, chamise chaparral, and ceonothus mixed chaparral. Of these, the scrub oak mixed chaparral is the most common shrubland cover type within the Black Butte Watershed. Figure 3 shows the approximate proportions of the shrubland communities found within the watershed boundary. As mentioned above, the shrubland communities make up 4% of this landscape and Figure 4 depicts the proportion of types of shrub cover that are found within that 4% of the landscape.

**Figure 3. Acres and proportion of shrubland cover types within the Black Butte Watershed.**

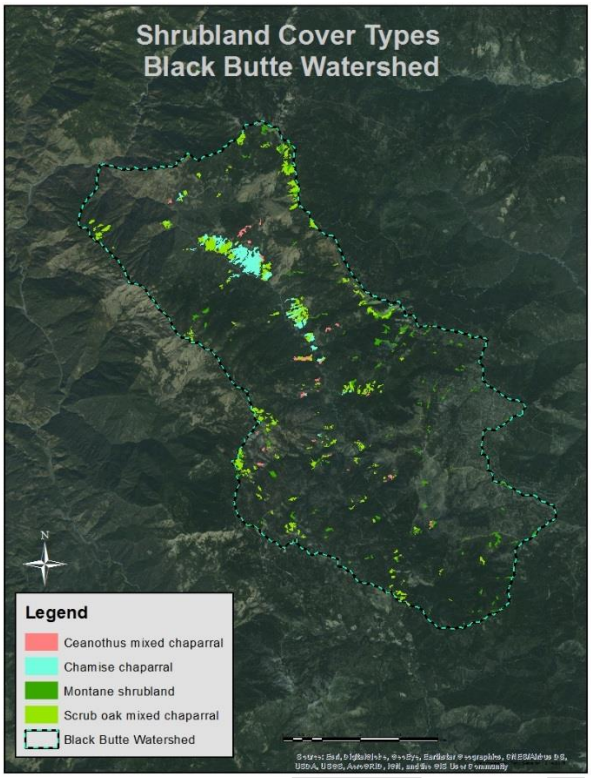
| Shrub cover type | ~ Acres | ~ Proportion of shrubland cover | ~ Proportion of watershed cover |
|---|---|---|---|
| Scrub oak mixed chaparral | 2,159 | 49% | 2% |
| Montane shrubland | 1,005 | 23% | 1% |
| Chamise chaparral | 969 | 22% | 1% |
| Ceonothus mixed chaparral | 261 | 3% | N/A |

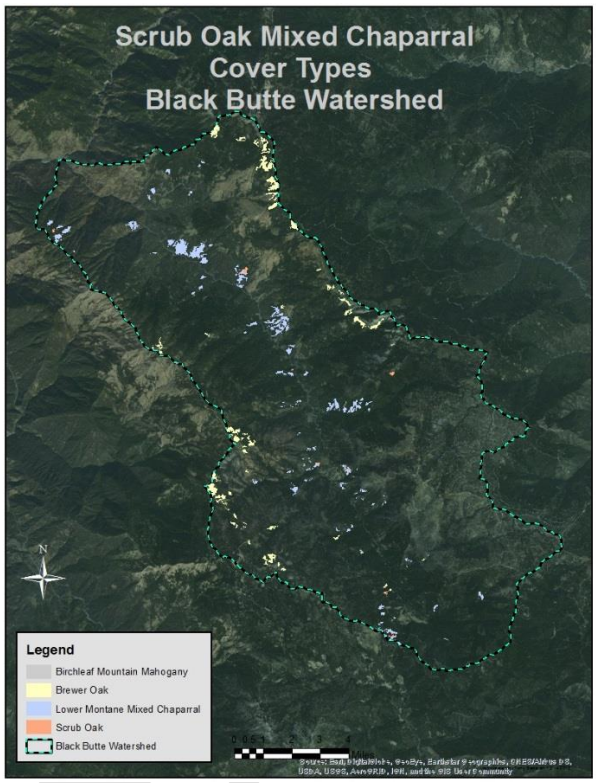
Figure 4 depicts the chaparral cover types in the northern and southern extents of the Black Butte Watershed including the area that encompasses the Wild and Scenic designation. Notice that most of the chaparral cover types are more common near the bottom of the drainage itself. This is due to the decreased elevation gradient that is encountered when moving from the high ridges and higher elevations of forestland to the lower elevations near the bottom of the drainage. Usually, climatic factors such as temperature, humidity, and precipitation regimes can influence the locations of the shrubland/chaparral communities. Soil type is another critical factor in dictating the existence of a specific cover type and where it thrives.

The shrub cover type classification from the Cal Veg layer also depicts the dominance of species within each of the cover types. In other words, what species is and individual likely to come across within these cover types in order to know which type of cover classification it may fall under and which of those species dominates a 'stand' of vegetation at a specific location. These will be referred to as the species cover types for each respective cover type classification. To put the frequency of each of the respective species cover types in a visual perspective, see the following maps (Figures 4 through 7). Note the legend of the maps and those specific cover types associated with each of the shrubland cover types. Chamise chaparral is mainly compose of chamise species, while montane shrubland consists of a variety of species that may dominate a site to the montane mixed chaparral which indicates a variety of species on a site.

Notice Figure 5 with the specific species that may be found in highest proportion of the scrub oak mixed chaparral cover types: birchleaf mountain mahogany, brewer oak, scrub oak, and lower montane mixed chaparral species mix where no single species is dominating the site. Referring back to Figure 3, the scrub oak mixed chaparral cover type is of the most common in the Black Butte Watershed in regards to chaparral (or mountain shrub community) mixed cover types.

**Figures 4 &5. Map showing shrubland cover types and distribution throughout the Black Butte Watershed and the specific scrub oak mixed chaparral species cover types distributions and locations.**



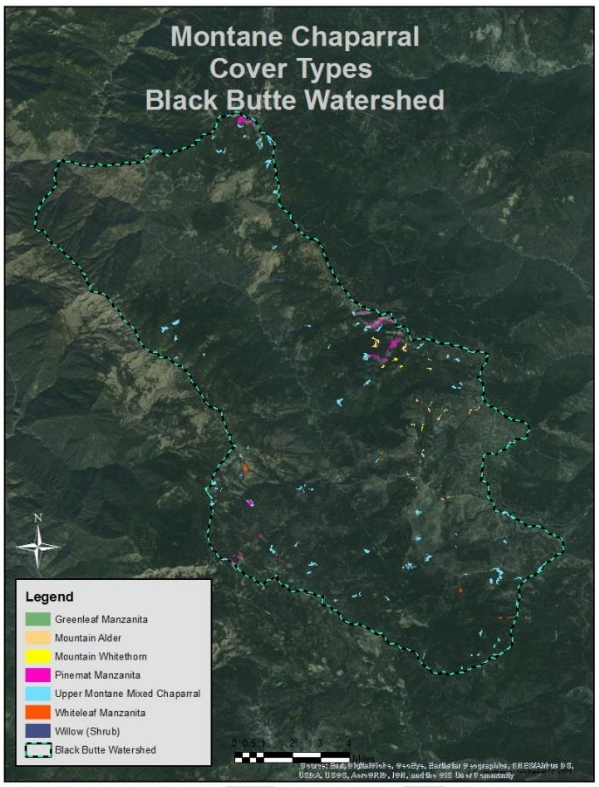

Figures 6 and 7 are depictions of montane shrubland and chamise chaparral cover types, which are both found in nearly the same proportion (each approximately 1,000 acres) of distribution within the Black Butte Watershed boundary. The montane chaparral cover type as a tendency to exist where moisture is prevalent longer into the warm, dry season as opposed to the chamise cover type that covers areas with more rapid drying conditions. This could be due to the distribution of the soil type where each of these cover types compete best. Notice the variety of species that consist of the montane mixed chaparral cover type and may be found in the highest of proportions to represent the respective cover type: greenleaf manzanita, mountain alder, mountain whitethorn, pinemat manzanita, whiteleaf manzanita, willow (shrub), and a general upper montane mixed chaparral species type which elicits stands of chaparral with a variety of vegetation that represents the montane mixed chaparral species cover type. Chamise is very general in that it is the mostly represented by chamise species in the highest proportion.

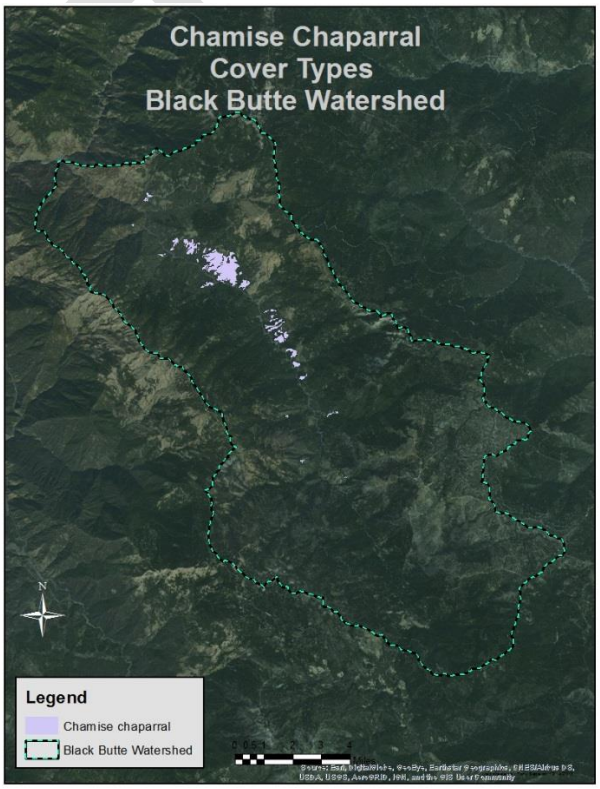
Figure 8 is a depiction of the ceanothus mixed chaparral cover type. *Ceanothus* sp. shrub is more commonly known as deerbrush and is a pioneer-type shrub species that establishes well after disturbance such as wildfire or timber harvest. This species cover type is of the smallest proportion of the chaparral cover types found within the Black Butte Watershed with just over 250 acres. It also is a valuable browse for ungulates in the spring when meristematic growth is succulent and new. Basically the two common associate species that are found in the highest of proportion to represent this cover type are a general manzanita chaparral with a component of deerbrush and wedgeleaf ceonothus.

## Herbaceous Component

As referenced above the herbaceous cover type within the Black Butte Watershed makes up the second smallest proportion of all the vegetation and totals approximately 8,000 acres or about 8% of the total land. These areas are important as they are suitable for livestock grazing, ungulate grazing, and foraging habitat for other species too. They also may contain threatened or endangered botanical species within this landscape. Valley grassland - annual, montane meadow, and alpine grassland and forbs are the three primary cover types of the herbaceous component that is found within the Black Butte Watershed boundary. Figure 9 is a depiction of these herbaceous cover types with respect to their acreage and proportions relative to all other vegetation within the confines of the watershed boundary.

**Figures 6 & 7. Maps showing the montane mixed chaparral and chamise chaparral cover types and distribution throughout the Black Butte Watershed.**




Notice how the annual grassland categorized as valley grassland in the Cal Veg cover type is the dominant herbaceous species cover type within the Black Butte watershed. These grasslands are adapted well to disturbances such as fire and livestock grazing and a good portion of these grasslands have dominant components of non-endemic species. Approximately three-quarters of all the herbaceous species cover types are made up of annual grasslands. Montane meadows are generally ecosystems that are associated with wet to water-logged soils during seasonal patterns, such as rainy seasons. These areas, like montane grasslands, exhibit a tendency to take longer to 'dry out' after the rainy season and have an ability to promote the proliferation of endemic grassland species composed of forbs and perennials. Relative to the rest of the herbaceous species cover types, montane meadows consist of about one-quarter of the total herbaceous component. Finally, the lack of alpine grassland

(only 2%) can be contributed to the lack of high alpine elevations within the Black Butte Watershed. Only the highest peaks on the Black Butte side of the watershed are accounted and consist of alpine-type grass species, which is a mix between annual and perennial grasses. Historic grazing practices, in conjunction with subsequent rainfall events, have contributed to the loss of soil in some of these areas to where the current vegetative structure has been altered significantly.

**Figure 8. Map showing the abundance and distribution of the ceonothus mixed chaparral species cover types.**

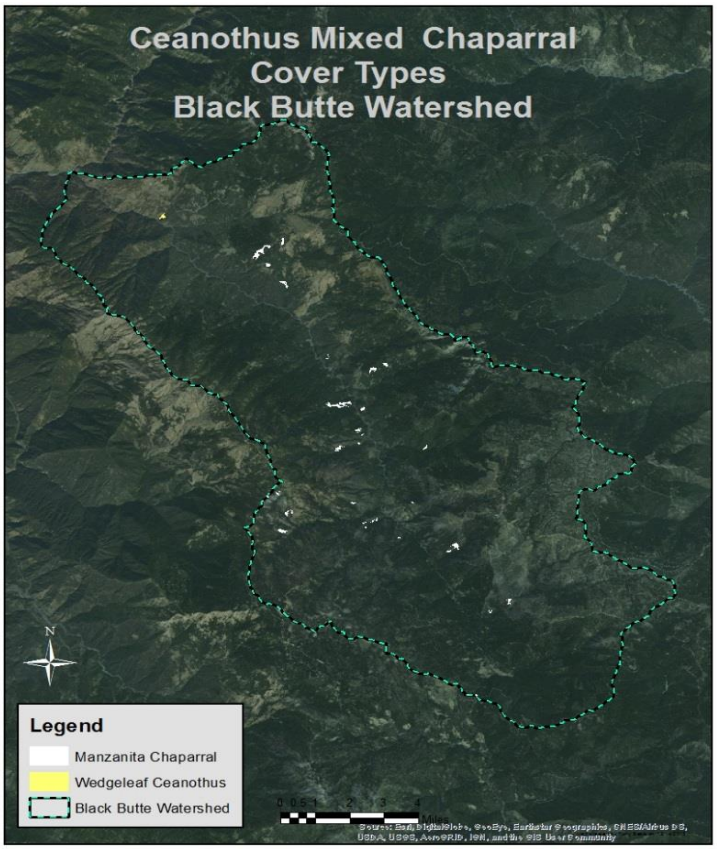
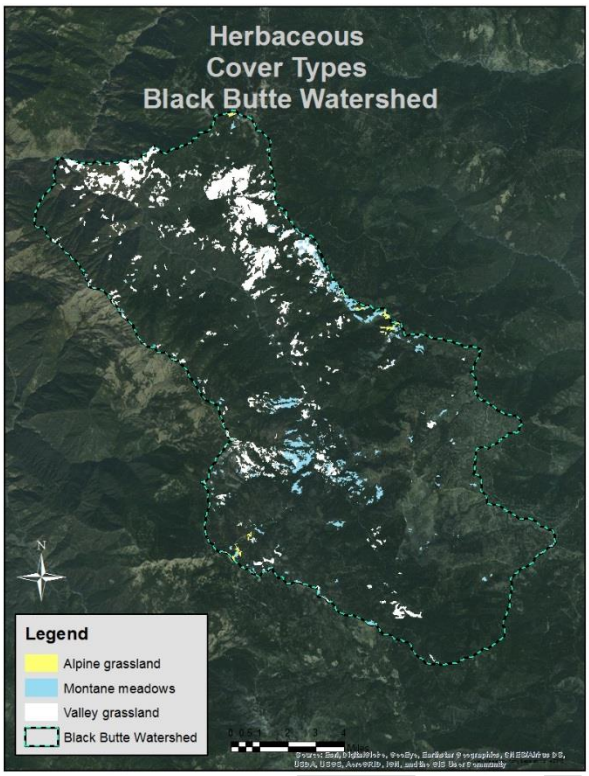


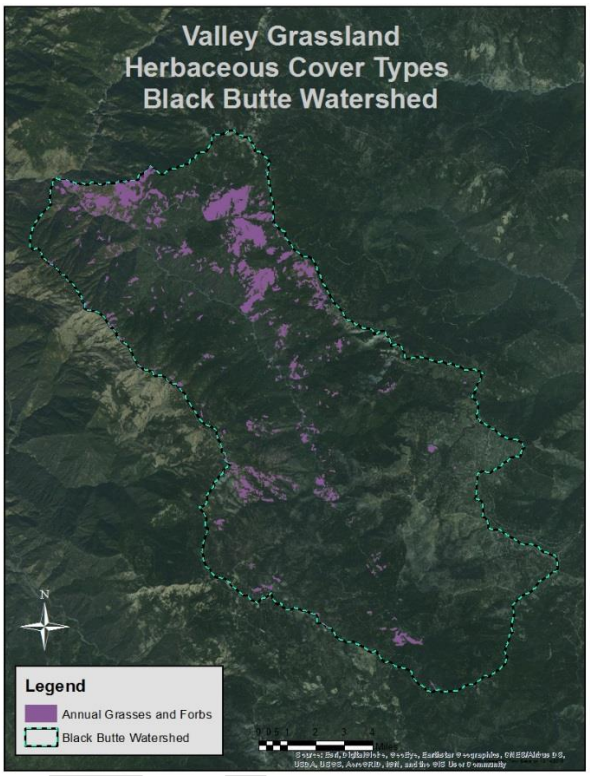

Figure 10 displays all 3 herbaceous species cover types across the Black Butte watershed to gain insight as to the amount and distribution of these 3 species cover types together. Figure 11 displays the annual grassland component alone within this landscape. Figure 12 the montane meadow species cover type and Figure 13 shows the alpine grassland locations on the highest peaks within the watershed itself where elevations are considerable and usually above tree line.

**Figure 9. Acreage and proportions associated with the herbaceous cover types within the Black Butte Watershed.**

| Herbaceous cover type | ~ Acres | ~ Proportion of herbaceous cover | ~ Proportion of Watershed cover |
|---|---|---|---|
| Valley grassland - annuals | 5,927 | 74% | 6% |
| Montane meadows | 1,892 | 24% | 2% |
| Alpine grassland and forbs | 134 | 2% | N/A |

**Figures 10 & 11. Illustrations of herbaceous cover types and the annual grassland species cover types proximities and distributions within the Black Butte Watershed landscape.**




## Hardwood Component

The hardwood forested cover type within the Black Butte Watershed consists of seven different species cover types: red alder, Oregon white oak, cottonwood-willow, canyon live oak, California coast live oak, California black oak, and blue oak-digger pine. Of those seven species cover types, canyon live oak and the blue oak-digger pine are the most common. These species cover types have a variety of species that dominate depending on site location and productivity. Figure 15 is depiction of the relevant acres and proportions of species cover types within the hardwood cover category across the entirety of the Black Butte watershed.

Referring back to Figure 2, hardwood forests compose over one-fifth of the vegetative types within the Black Butte watershed. Oregon white oak is the most common hardwood species cover type within the Black Butte watershed with over 10,500 acres of it being present. In Figure 16, the display represents just Oregon white where one can make an inference of just how much Oregon white oak is present in the Black Butte watershed relative to all of the 100,000 + acres. By itself, the Oregon white oak species cover types cover approximately 10% of all of the land within the watershed. This species is an important component of cover and food source for various species of animals living in the Forest. Lack of disturbance or treatment allows encroachment of conifer on these forest types which can eventually lead to a decrease in their persistence.

**Figures 12 & 13. Illustrations of the montane meadow and alpine grassland/forb species cover type proximities and distributions within the Black Butte Watershed landscape.**

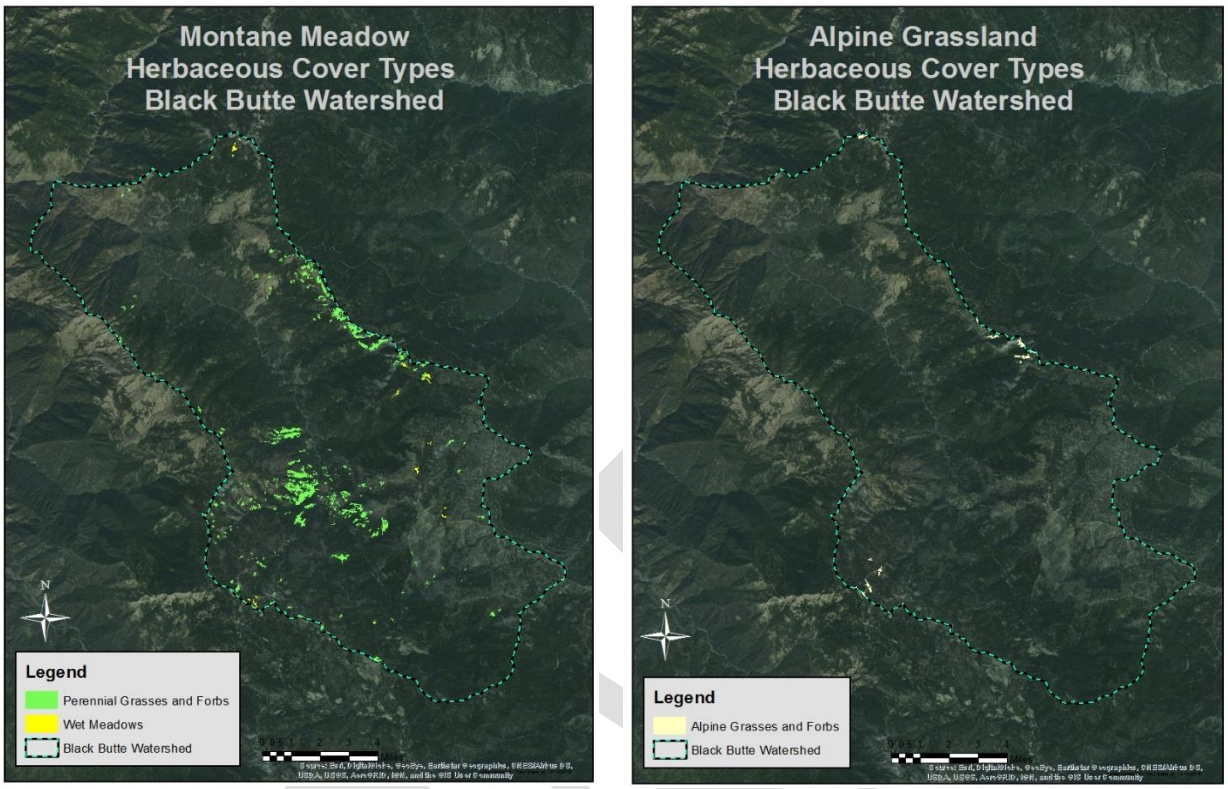


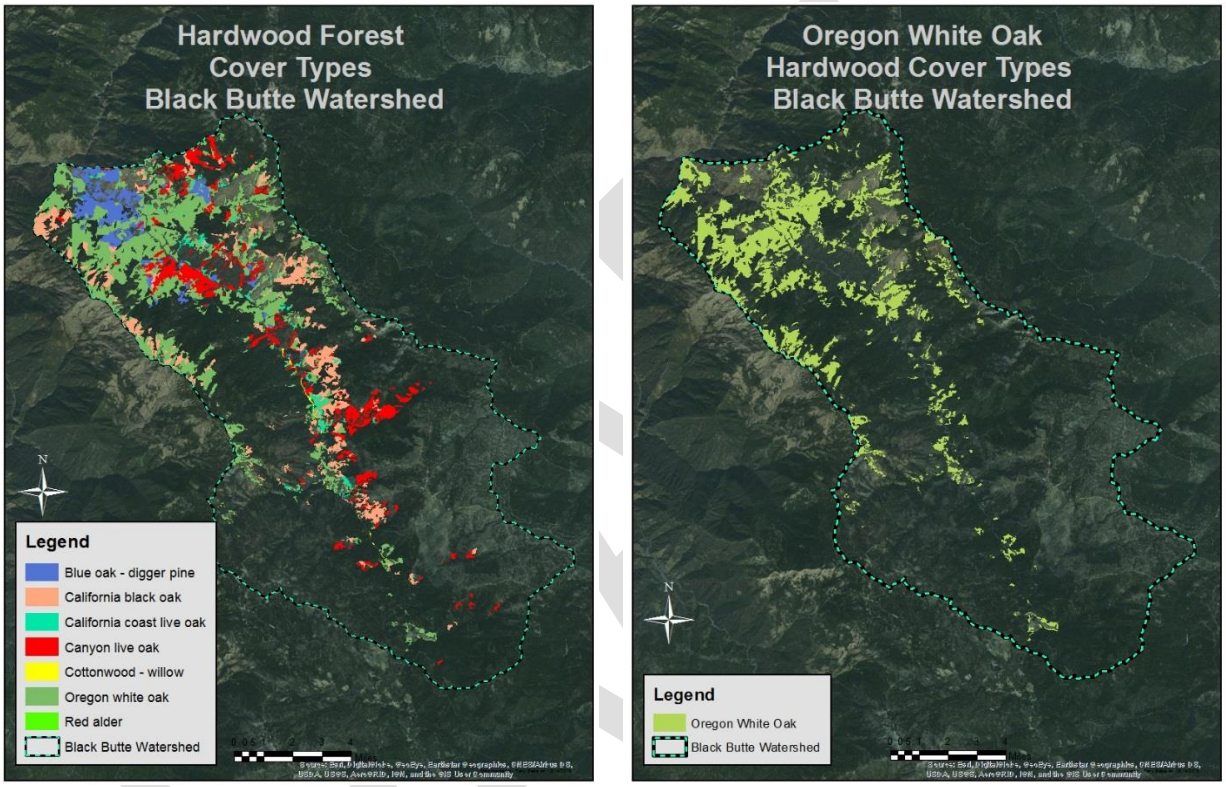

**Figure 14. Acreage and proportions associated with the hardwood cover types within the Black Butte Watershed.**

| Hardwood cover type | ~ Acres | ~ Proportion of hardwood cover | ~ Proportion of Watershed cover |
|---|---|---|---|
| Oregon white oak | 10,547 | 50% | 10% |
| Willow-cottonwood | 76 | N/A | N/A |
| Canyon live oak | 3,610 | 17% | 3% |
| California coast live oak | 575 | 3% | 1% |
| California black oak | 3,968 | 18% | 4% |
| Blue oak-digger pine | 2,155 | 10% | 2% |
| Red Alder | 12 | N/A | N/A |

Willow-cottonwood species cover types are displayed alone in Figure 17. Red alder locations are displayed in Figure 18. These two hardwood forest cover types are rare within the Black Butte watershed with less than 100 acres being present between both cover types. All of the willow-cottonwood stands of forest are adjacent to the Black Butte River, which one can make the inference that these forest types are riparian in nature. Water is essential to its presence. Red alder is also more

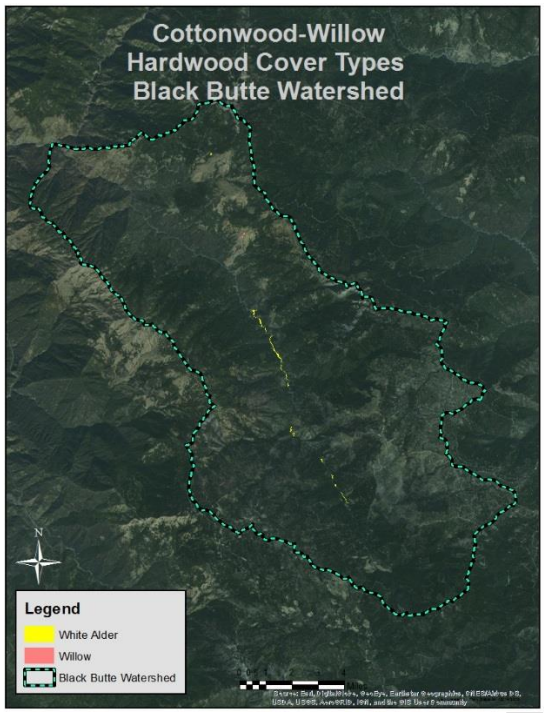
adapted to prevail where sites are wet and hold moisture longer into the season. Notice the main species that represents the red alder species cover type within the watershed is bigleaf maple. This that bigleaf maple is the species with the highest proportion within them and again, these stands are usually adjacent to streams, wet meadows, or any other areas that have high concentrations of water available throughout the majority of the year.

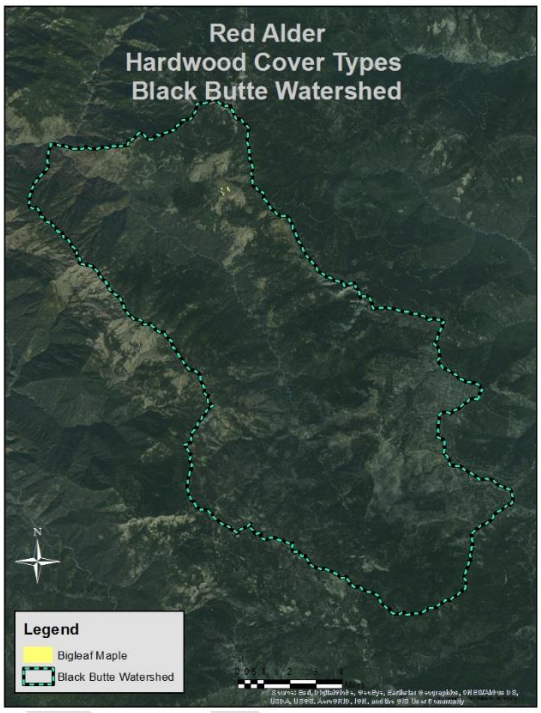
**Figures 15 & 16. Illustrations of the presence of all hardwood cover types, along with the proximities and distribution of Oregon white oak species cover types within the Black Butte watershed.**



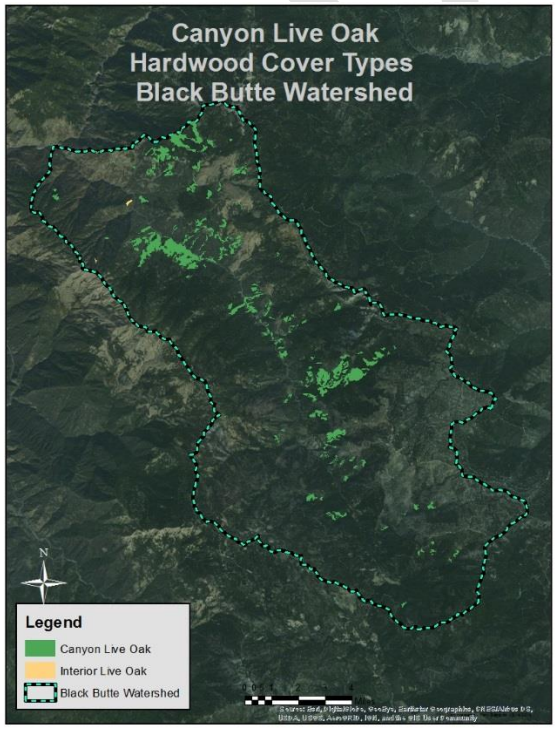

Figures 19 & 20 display canyon live oak and California black oak species cover type presence and distribution throughout the Black Butte watershed. They make up 17% and 18% of the total hardwood component respectively, within the watershed. Proportions relative to the entire watershed are 3% and 4%. California black oak is emphasized as a valuable species for wildlife utilization in regards to food, cover and nesting opportunities. Notice in the legend for California black oak species cover type there is a key item for California black oak itself but also for montane mixed hardwood. This represents stands that are wetter that what is common in the watershed and California black oak doesn't quite dominate as much as it is a common associate. Red alder, California bay, bigleaf maple, and other species may intermingle in these stands with California black oak. Referring to the canyon live oak map, interior live oak species, otherwise known as tanoak are found within the area, though it is a very small population. Some oaks have a tendency to hybridize and populations of hybridized individuals establish and proliferate.

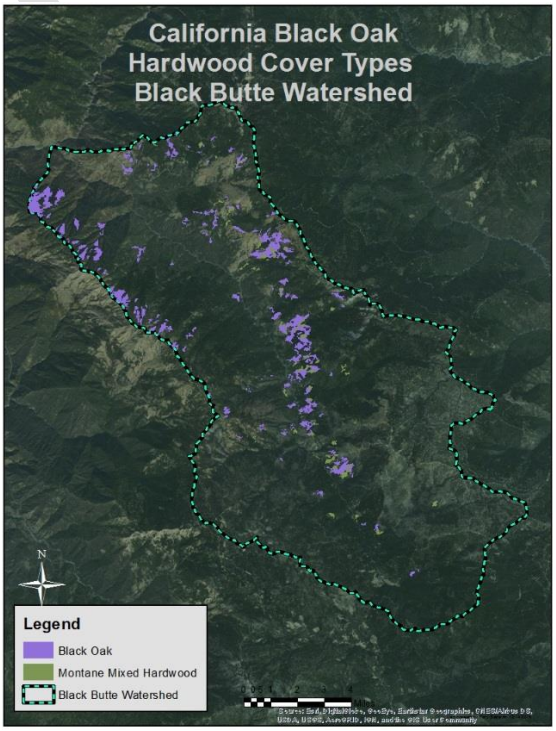
**Figures 17 & 18. Illustrations of the presence of willow-cottonwood and red alder species cover types within the Black Butte watershed.**




**Figures 19 & 20. Illustrations of the presence of canyon live oak and California black oak species cover types within the Black Butte watershed.**

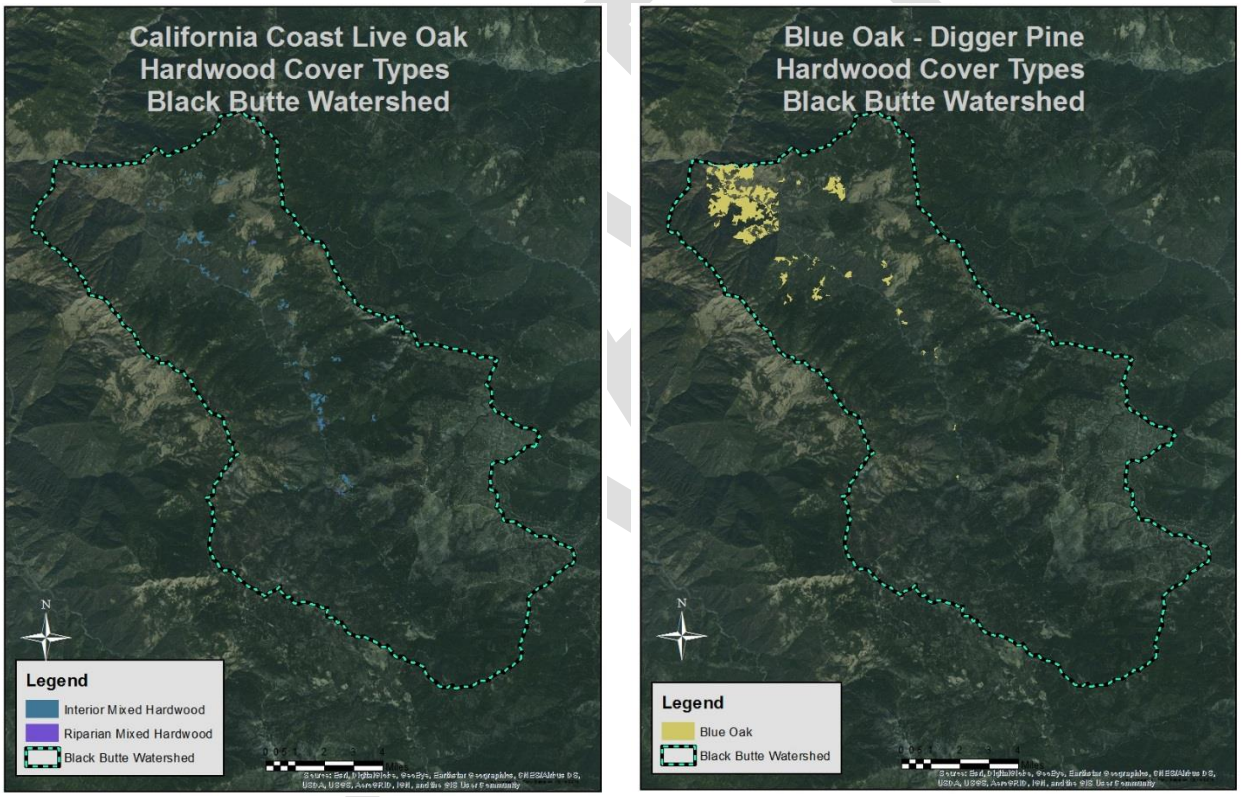


California coast live oak and blue oak – digger pine species cover types are represented in illustrations 21 and 22. California coast live oak prefers a coastal-type environment as opposed to the ability of canyon live oak having the ability to thrive in steeper gorge country with soils that have less water holding capacity. Being that the Black Butte watershed is a transition area from the west side of the Coast Range to the east side, it is no surprise that both species are present, though California coast live oak only has approximately 575 acres vs. over 3,600 acres of canyon live oak.

The blue oak – digger pine species cover type is usually a transitory forest type moving from valleys to higher elevation areas, where digger pine, otherwise known as gray pine, is a common associate with blue oak. There is also sometimes a high component on chaparral inter-mingling with this species cover types.

**Figures 20 & 21. Illustrations of the presence of California coast live oak and blue oak – digger pine species cover types within the Black Butte watershed.**




## Mixed Conifer Hardwood Component

The mixed conifer hardwood component accounts for approximately 18% of all cover types found within the Black Butte watershed. These forests provide a variety of habitats for terrestrial species. Most of these forested stands have a higher proportion of conifer within the stands with hardwood species intermixed within them. Oaks, madrones, and other hardwood species may be present intermingling with conifers mid and sub-canopy strata of these forested stands. Seven species cover types make up

the mixed conifer hardwood forest cover type component: white fir, Sierra Nevada mixed conifer, ponderosa pine – Douglas-fir, ponderosa pine, Douglas-fir, Jeffrey pine, and blue oak – digger pine. Of those, the ponderosa pine – Douglas-fir and Sierra Nevada mixed conifer species cover types are the most common, while blue oak – digger pine and Jeffrey pine are the least common. Figure 22 represents the approximate acreage and proportion metrics of each of the species cover types for the mixed conifer hardwood cover type within the Black Butte watershed.

**Figure 22. Acreage and proportions associated with the mixed conifer / hardwood cover types within the Black Butte Watershed.**

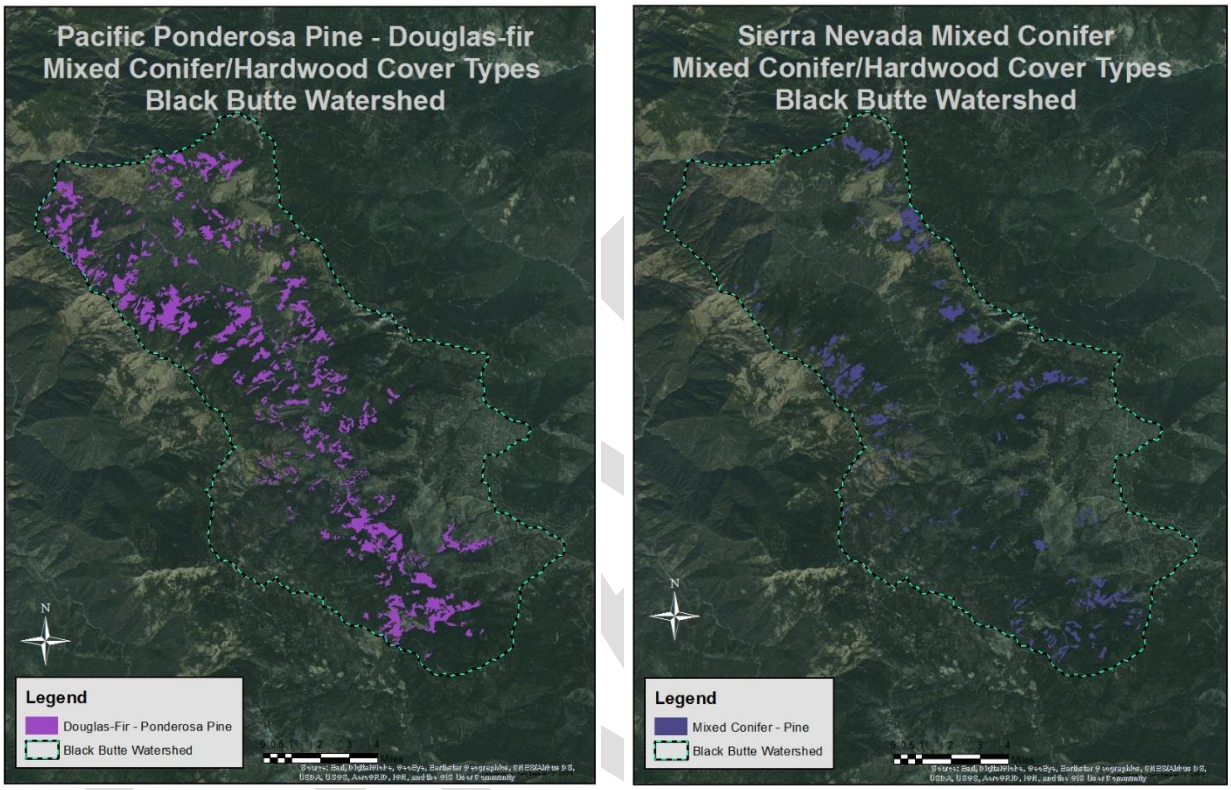
| Mixed conifer hardwood cover type | ~ Acres | ~ Proportion of mixed conifer hardwood cover | ~ Proportion of watershed cover |
|---|---|---|---|
| White fir | 1,233 | 7% | 1% |
| Sierra Nevada mixed conifer | 4,129 | 22% | 4% |
| Ponderosa pine – Douglas-fir | 9,771 | 52% | 9% |
| Ponderosa pine | 898 | 5% | 1% |
| Pacific Douglas-fir | 2,722 | 14% | 3% |
| Jeffrey pine | 21 | N/A | N/A |
| blue oak – digger pine | 185 | 1% | N/A |

Figure 23 is a depiction of the ponderosa pine – Douglas-fir mixed conifer hardwood species cover type. Ponderosa pine and Douglas-fir have a close connection as common associates within stands and within the ponderosa pine – Douglas-fir mixed hardwood species cover type, they are the two species that primarily dominate the overstory and in nearly equal distribution within these stands, likely with a heavy component of black oak, live oak, madrone, and Oregon white oak in all strata within these stands depending on the distribution of openings. In theory, conifers would continue to increase their proportion within these stands with a lack of disturbance and eventually become a conifer species cover type and the composition of the coniferous component would dictate exactly which conifer cover type it would become. Comparing the ponderosa pine – Douglas-fir mixed conifer hardwood species cover type to the Sierra Nevada mixed conifer hardwood cover type, there is likely a heavier component of incense cedar, sugar pine, and white fir within those stands as opposed to just strictly the ponderosa pine – Douglas-fir mixed conifer hardwood species cover types. Ponderosa pine – Douglas-fir mixed conifer hardwood species cover type encompasses nearly 10% of the entire Black Butte watershed and represent over half of the mixed conifer hardwood cover types within the watershed. Notice that those ponderosa pine – Douglas-fir dominating stands with a significant hardwood component are shaded in purple in Figure 23.

The Sierra Nevada mixed conifer hardwood species cover type within the Black Butte watershed comprises about 22% of the mixed conifer hardwood cover type and about 4% of the total area of the watershed. Sierra Nevada mixed conifer hardwood, as mentioned, has a higher component of conifer species which is due to either a wetter, cooler site or an area that has had disturbance excluded for a significant amount of time. Generally, higher elevations and north-facing slopes have a higher incidence

of Sierra Nevada mixed conifer hardwood species cover types and black oak, white oak, madrone, and live oak may be found as the hardwoods closely associated within this specific species cover type system. Figure 24 represents the Sierra Nevada mixed conifer hardwood species cover type within the Black Butte Watershed.

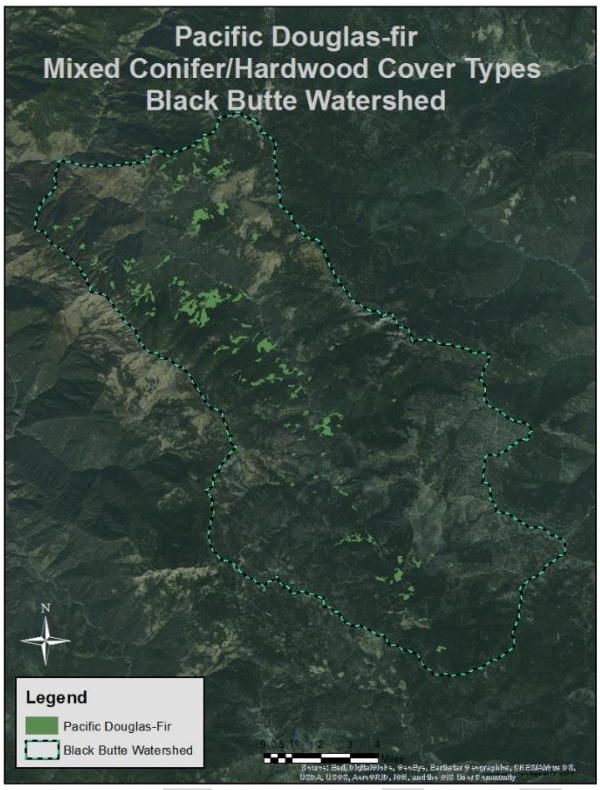
**Figures 23 & 24. Illustrations of the presence of ponderosa pine – Douglas-fir mixed conifer hardwood and Sierra Nevada mixed conifer hardwood species cover types within the Black Butte watershed.**

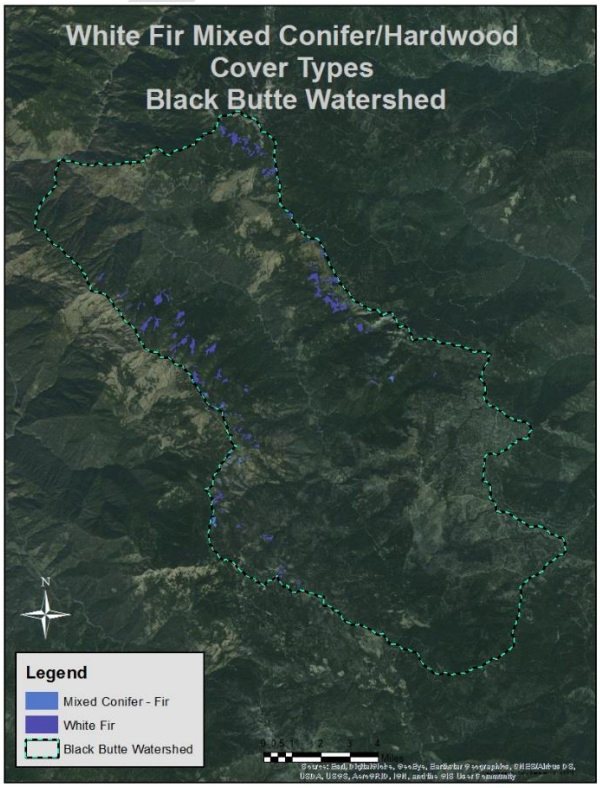



Pacific Douglas-fir and white fir mixed conifer hardwood cover types are the next most common mixed conifer hardwood cover types within the Black Butte watershed with approximately 2,700 and 1,200 acres, respectively. Pacific Douglas-fir stands may be found with some of their common associates such as ponderosa pine, sugar pine, incense-cedar, red fir and white fir, but these Pacific Douglas-fir mixed conifer hardwood species cover types have a tendency to be dominated by Douglas-fir with very few of the stands proportion (<20%) being composed of those other species. This cover type is extensive in that its distribution ranges from southern British Columbia through the Washington and Oregon Cascades and Coast Ranges to Mendocino County, California, which is where it can be found in its most southern locations. If left undisturbed, climax-type species such as red and white fir will become established. With these locations covered as mixed conifer hardwood, it is evident that along with the coniferous common associates that Oregon white oak, madrone, and possibly even tanoak are mixed in with these stands giving it the mixed conifer hardwood categorization. Figure 25 is a depiction of Pacific Douglas-fir mixed conifer hardwood species cover type within the Black Butte watershed.

White fir mixed conifer hardwood species cover type consists of predominately white fir making up the majority of the basal area, but when mortality occurs, hardwood type species establish and flourish until growing conditions become unfavorable. Madrone, along with brush species such as pinemat manzanita, Greenleaf manzanita, and whitethorn all grow well within these stands of white fir that consist of less dense conditions. Figure 26 illustrates white fir mixed conifer hardwood species cover type locations within the Black Butte watershed.

**Figures 25 & 26. Illustrations of the presence of Pacific Douglas-fir mixed conifer hardwood and white fir mixed conifer hardwood species cover types within the Black Butte watershed.**



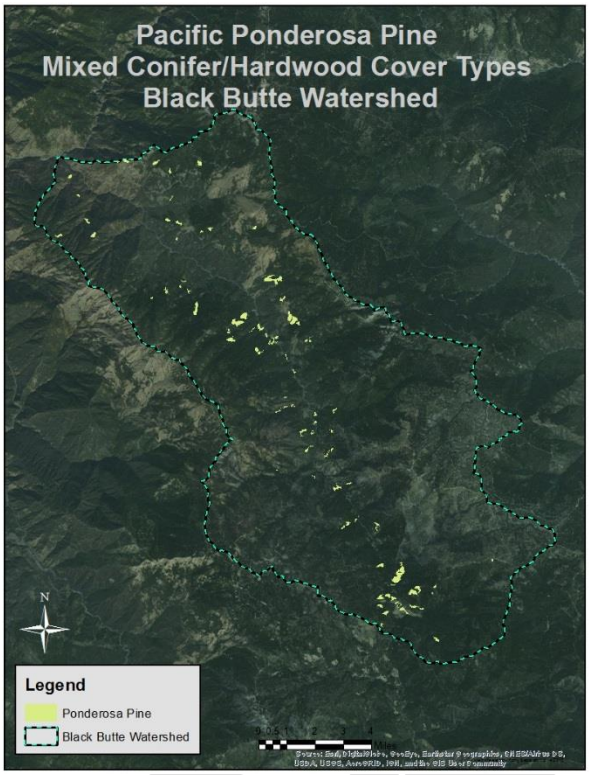



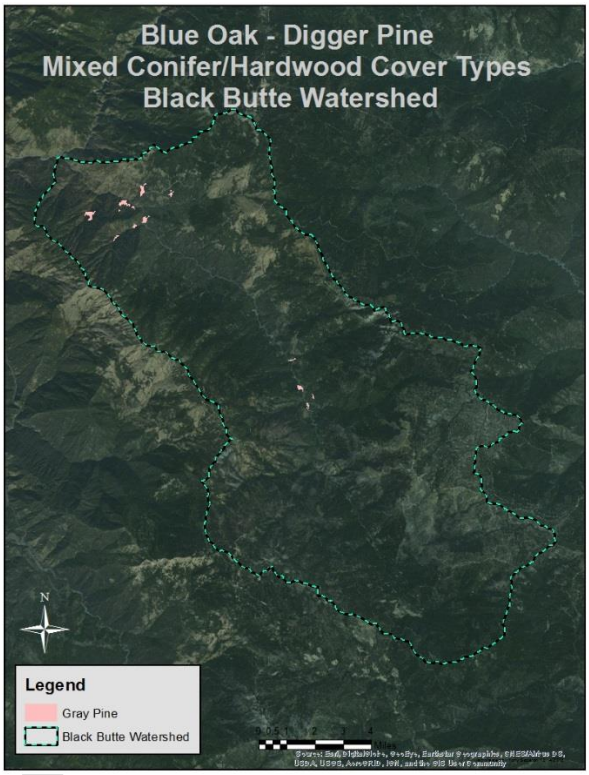

Ponderosa pine and blue oak – digger pine mixed conifer hardwood species cover types have 898 and 185 acres respectively. Ponderosa pine mixed conifer hardwood species cover types should be nearly pure with pine, with these stands in the Black Butte watershed having a presence of Oregon white oak, California black oak, and Pacific madrone as common hardwood component associates. Canyon live oak can also be a common associate in these parts, known as the Klamath Mountains area of the Coast Range. Figure 27 displays the ponderosa pine mixed conifer hardwood species cover type locations within the Black Butte Watershed.

As for blue oak – digger pine mixed conifer hardwood species cover type locations in the Black Butte watershed, refer to Figure 28. Blue oak and digger pine occur together over most of the oak woodland or foothill woodland of California. At lower elevations, these stands may be mostly pure blue oak, while at higher elevations, they can be mostly digger pine, with hardwood associates such as interior live oak,

canyon live oak, California black oak, California scrub oak, and coast live oak. Figure 28 displays the blue oak – digger pine mixed conifer species cover type locations within the Black Butte watershed.

**Figures 27 & 28. Illustrations of the presence of Ponderosa pine mixed conifer hardwood and blue oak – digger pine mixed conifer hardwood species cover types within the Black Butte watershed.**




The Jeffrey pine mixed conifer hardwood species cover type is of the least amount of acres within the watershed with only 21 acres total. Jeffrey pine varies from pure stands through diverse associations where Jeffrey pine makes up a majority of the stocking. Oregon white oak and California black oak are common associates, along with various shrub species like the manzanitas in the area and whitethorn. Figure 29 displays the 21 acres of Jeffrey pine found within the Black Butte watershed.

## Conifer Component

Overall, pure conifer species cover types make up over 50,000 acres or around 49% of the total area of the Black Butte watershed. Of those acres, Sierra Nevada mixed conifer species cover type is the most common covering approximately 25,000 acres of forested area. Jeffrey pine stands are in the least abundance with less than 500 acres or about 1% of the conifer species cover types within the watershed. Figure 30 shows the total acreages and proportions of each conifer species cover type relative to the cover type itself and relative to the amount of acres in the Black Butte watershed.

Sierra Nevada mixed conifer species cover type is a composition of white fir, ponderosa pine, sugar pine, incense-cedar, California black oak, and Douglas-fir either in a variable mixture or in groups of pure

species. The proportion of each species is highly variable and white fir is nearly always present and frequently abundant on northerly slopes or at higher elevations, while ponderosa pine may predominate on southerly slopes. Sugar pine is found on more mesic sites and rarely does it comprise a majority of the species mix. See Figure 31 to gain insight as to the abundance and distribution of all Sierra Nevada mixed conifer species cover types within the Black Butte Watershed.

**Figure 29. Illustrations of the presence of Jeffrey pine mixed conifer hardwood species cover types within the Black Butte watershed.**

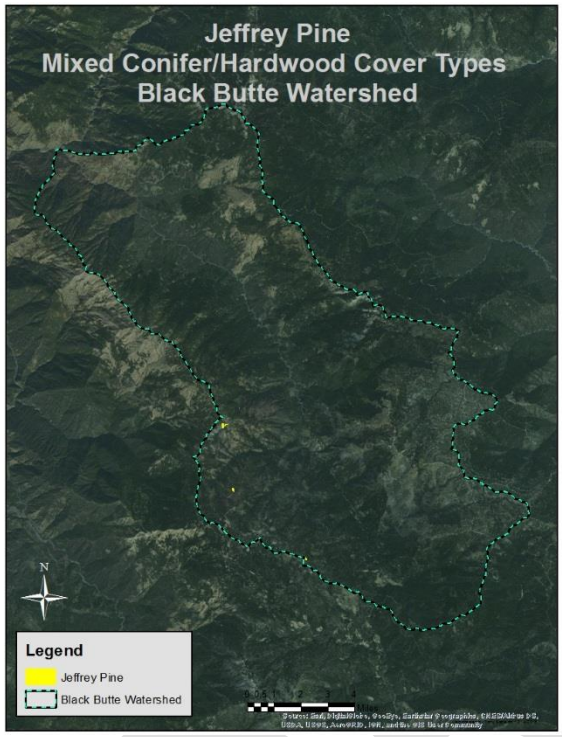



Figure 32 is a map showing the presence of ponderosa pine – Douglas-fir conifer species cover types within the Black Butte watershed. This species cover type represents about 20% of the conifer species cover type within the watershed and with Sierra Nevada mixed conifer, cover nearly 70% of the total amount of conifer cover types within the watershed. 35% of the entire Black Butte watershed is covered with both Sierra Nevada mixed conifer and ponderosa pine – Douglas-fir species cover types combined.

Ponderosa pine – Douglas-fir species cover types are indicative of stands where either ponderosa pine or Douglas-fir dominate without significant amounts of white fir or incense-cedar. Rarely are these stands even-aged and it's common for them to be two-storied. In this region, ponderosa pine should generally dominate, but with lack of disturbance, dense, shady stands develop and pine becomes sparser, with Douglas-fir becoming more abundant. Disturbance would reverse that trend. Logging and fire favor the establishment of ponderosa pine. Partial disturbance favors understory and intermediate stand strata and tend to maintain the ponderosa pine – Douglas-fir type. If conifer regeneration is slow and fails, however, brushfields may develop, which in turn, would eventually be slowly invaded by shade-tolerant conifers.

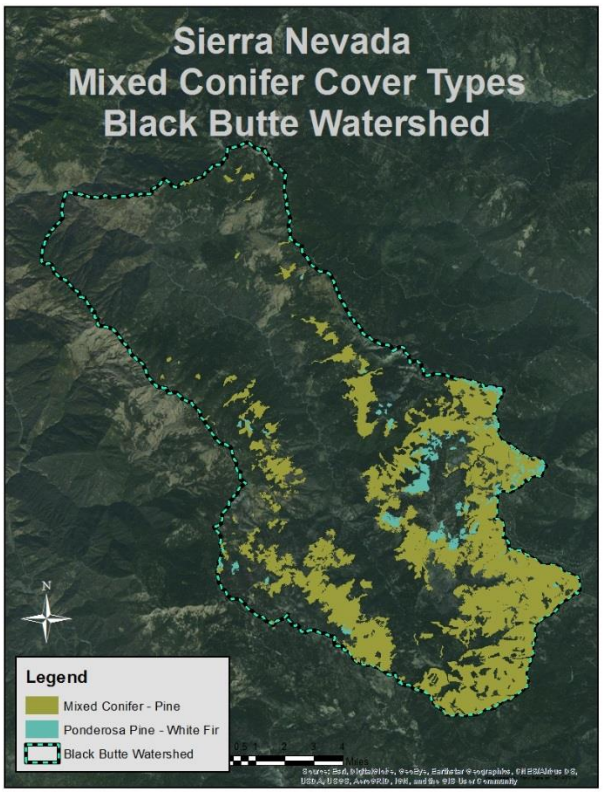
Figures 33 and 34 are depictions of the white fir and red fir conifer species cover types. White fir conifer species cover type consists of over 9,300 acres of ground within the Black Butte watershed, while red fir has approximately 2,400 acres.

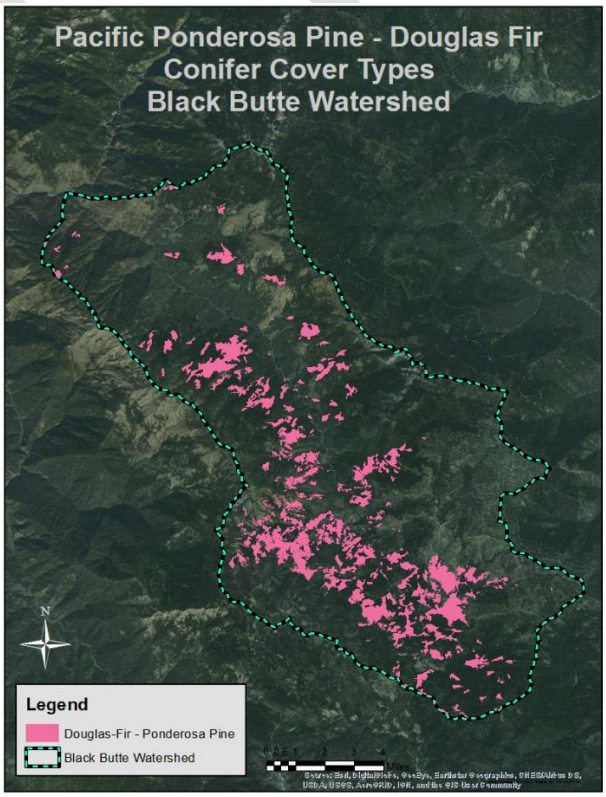
In white fir conifer species cover types (Figure 33), white fir comprises the majority of the stocking or it may occur in pure stands. Where a mixture occurs, other species commonly present are red fir, ponderosa pine, Jeffrey pine, sugar pine, and Douglas-fir. A selective logging history within the Black Butte watershed where ponderosa pine, sugar pine and Douglas-fir were harvested in favor of white fir may have led to more stands of white fir that exist today that may have existed in the past with a normal historic regime of disturbance or with logging methods that selected white fir in conjunction

**Figure 30. Acreage and proportions associated with the conifer species cover types within the Black Butte Watershed.**

| Conifer forest cover type | ~ Acres | ~ Proportion of conifer cover | ~ Proportion of watershed cover |
|---|---|---|---|
| White fir | 9,370 | 19% | 9% |
| Sierra Nevada mixed conifer | 25,406 | 50% | 25% |
| Ponderosa pine – Douglas-fir | 10,094 | 20% | 10% |
| Ponderosa pine | 570 | 1% | 1% |
| Pacific Douglas-fir | 2,121 | 4% | 2% |
| Jeffrey pine | 370 | 1% | N/A |
| Red fir | 2,443 | 5% | 2% |

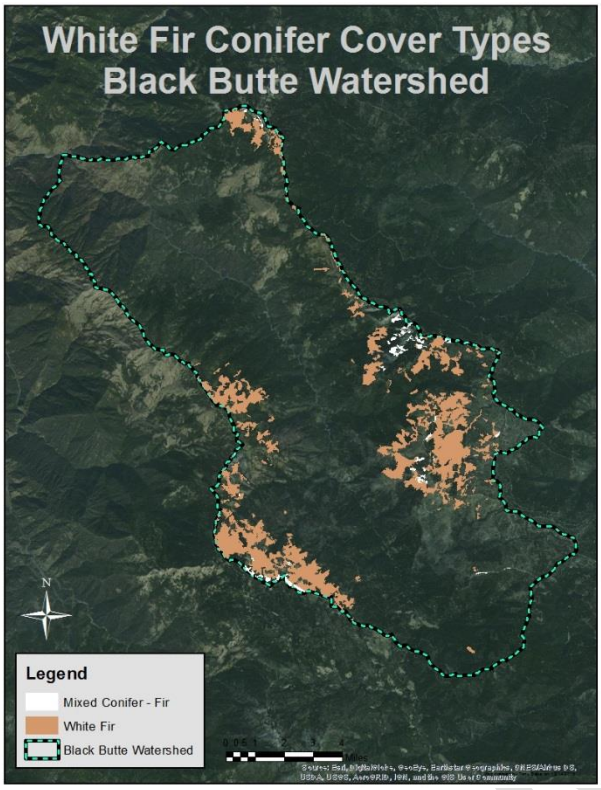
**Figures 31 & 32. Illustrations of the presence of Sierra Nevada mixed conifer species cover type and ponderosa pine – Douglas-fir conifer species cover type within the Black Butte watershed.**

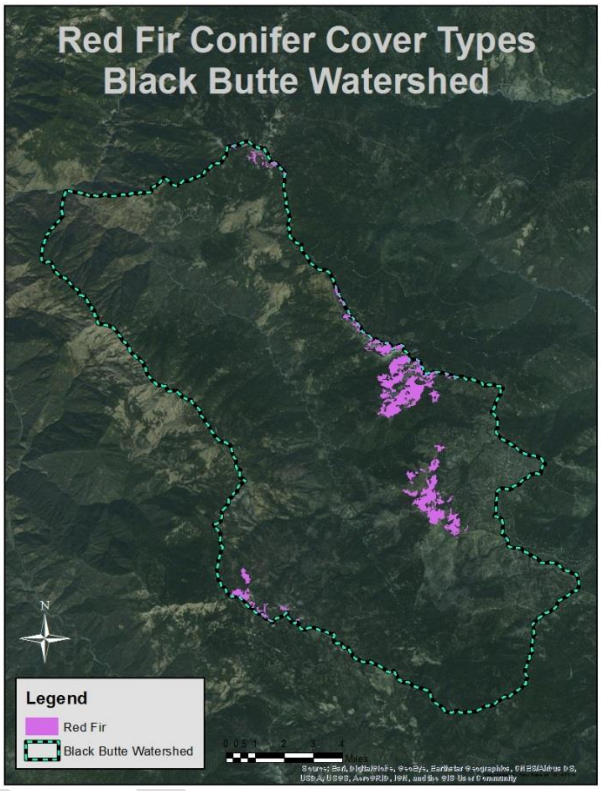



with pine or Douglas-fir. Generally, white fir is rated as shade tolerant or very tolerant and can, at least in the absence of fire, supplant its less tolerant associates on mesic sites. It has an ability to grow slowly after its establishment and increases to more than a foot per year after its first 5 years of growth.

**Figures 33 & 34. Illustrations of the presence of white fir conifer species cover type and red fir conifer species cover type within the Black Butte watershed.**



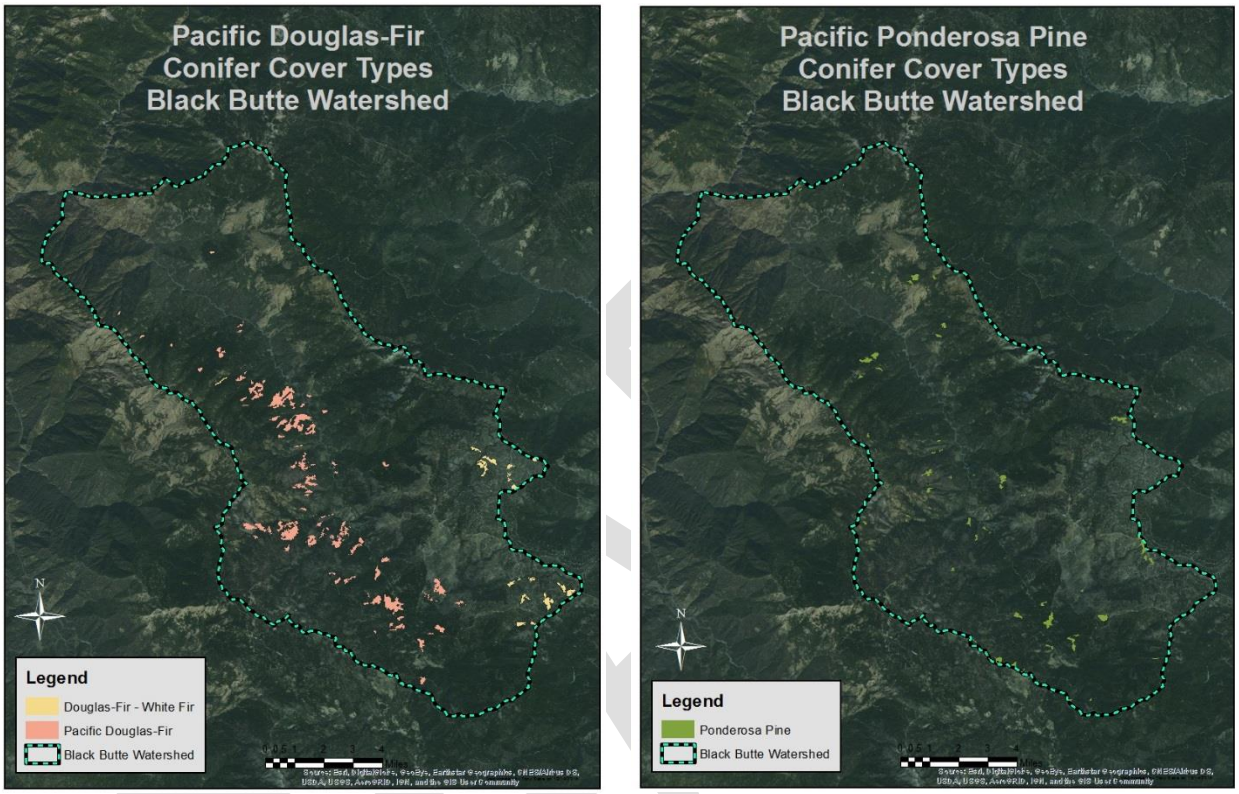




Red fir is another climax species, like white fir and is usually pure but may comprise only a majority of the basal area stocking. It associates occasionally with Jeffrey pine (on more arid slopes) and white fir and sugar pine at its lower limits. Within the Black Butte watershed, this species cover type clings to the highest elevations and beneath dense stands, undergrowth is sparse except in shallow drainages and on benches. Where disturbance has taken place within these species cover types, lower vegetation is often of species that differ from those characteristic of closed stands. Greenleaf manzanita and whithtorn occupy areas where openings occur in these stands and pinemat manzanita is thought to be an indicator of repeated burning in these forest cover types. Figure 34 is a depiction of red fir species cover types within the Black Butte watershed.

Pacific Douglas-fir conifer species cover type has a little over 2,000 acres within the Black Butte watershed and is one of the most well-known, extensive and, in volume of wood, highly productive forest cover types in the world. These species cover types comprise at least 80 percent Douglas-fir and may have red fir, madrone, Oregon white oak, ponderosa pine, incense-cedar and sugar pine occurring in them. Natural Douglas-fir stands typically regenerate after wildfire in partial shade cast by fire-killed trees. Seed is provided by scattered surviving trees or islands of trees. Dense, young stands develop and mortality from suppression relieves overcrowding. Eventually, without disturbance, red and white fir can take over these forest types unless timber harvest or fire renew the cycle. Figure 35 depicts the Pacific Douglas-fir species cover type within the Black Butte watershed.

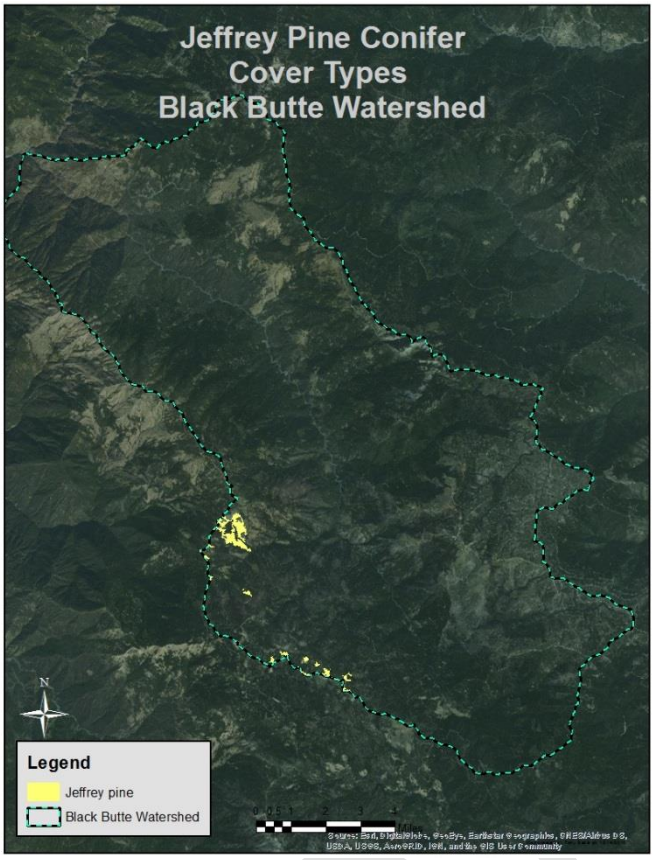
Pacific ponderosa pine species cover type is represented with just 570 acres in the Black Butte watershed. Pine should be nearly pure in these stands, although Douglas-fir, Oregon white oak, California black oak, madrone, white fir, incense-cedar, and even possibly some gray pine and knobcone

pine, depending on elevation, gradient, aspect, etc. This species cover type is well-adapted to a climate characterized by long, hot, dry summers, and cool, moist winters. Ponderosa pine is a frequent, heavy seed producer, resilient, and long-lived. It becomes fire resistant at a young age due to the thickening bark as it grows. Disturbance from fire and cutting can shift this species cover type to subclimax oak woodland or chaparral communities. Figure 36 is a map of Pacific ponderosa pine presence within the Black Butte watershed.




Finally, Jeffrey pine conifer species cover type only consists of 370 acres within the Black Butte watershed boundary. In the past, Jeffrey pine was mistakenly included with ponderosa pine types, yet these two yellow pines are genetically, physiologically, and ecologically distinct. They rarely hybridize and can readily be distinguished on the ground. Compared to ponderosa pine, Jeffrey pine typically grows in the harsher climatic and edaphic environments. Physilogically, Jeffrey pine has a greater ability than ponderosa pine to grow roots and take up nutrients on infertile soils. Jeffrey pine also completes growth sooner, enter dormancy earlier, and requires greater cold exposure to enable rapid bud break and shoot growth. Such attributes enhance the competitive position of Jeffrey pine in cold, xeric, and infertile sites. Figure 35 is a depiction of Jeffrey pine within the Black Butte watershed.

**Figure 35. Illustrations of the presence of Jeffrey conifer species cover type within the Black Butte watershed.**




## Effects Analysis

Alternative 1 (No Action)

Conditions, trends, and management of forestry resources will remain the same as current under alternative 1. Since there are no ground disturbing activities proposed actions under this alternative, there are no cumulative effects.

Alternative 2 (Proposed Action)

Generally, adoption of the CRMP for the Black Butte River and Cold Creek corridors will have minimal impacts from a vegetation perspective. Referring back to Figure 1 and 2, it is apparent that the majority of the area with wild and scenic corridor consists of either hardwood communities, with some of the areas consisting of mixed conifer forested communities. Excluding treatments from those areas allows succession of seral communities to follow their endemic patterns in lieu of fire suppression. As the rest of the watershed remains within the management direction under the Mendocino National Forest Land and Resource Management Plan (LRMP), matrix and LSR land designations will be managed in reference to this respective document. Since this proposal does not have any site specific projects, additional

NEPA environmental analysis would be done for any proposed treatments or ground disturbing activities to ensure Wild and Scenic River values are protected.

Figure 36 is a depiction of the LRMPs land allocations that allow for the management of vegetation under a variety of objectives. The late seral reserves (LSR) land allocation emphasizes management of forested conditions that are favorable for wildlife species that flourish in conditions where forests are dense (40% + canopy cover) with trees that have large diameters or are of a respective age class (~120 yrs +). Management in this land allocation usually trends towards restoration-type goals and objectives in an attempt to mimic the historic range of variability in these forest types before the area experienced intensive forest management activities in conjunction with 100 years of fires suppression. Notice on Figure 36 that almost the entire area to the west of the Black Butte River within the confines of the watershed itself is under the LSR land allocation.

Details of activities that are allowed for implementation in order to provide desired future conditions within the LSRs can be found in the Late Seral Reserve Assessments for the Mendocino National Forest. This information addresses operational constraints for vegetative characteristics in managing LSRs, along with desired levels of residual snags and coarse woody debris and size classes of those items, desired canopy cover levels, and distribution of diameter classes, just to name a few. With that, the effects of activities taking place within the LSR in the Black Butte watershed should have minimal effects on the wild and scenic characteristics in the designated area.

As for matrix land within the Black Butte watershed, LRMP direction is to provide management for multiple objects, including outputs from the timber resource. More intensive management activities are permitted to where larger openings are acceptable by mechanical means. From a viewshed standpoint, some areas within the watershed may have areas that appear to have been altered by some form of vegetation management activities, but impacts should be minimal within the designated wild and scenic portion due to the proximity of forested stands from within the designated area.

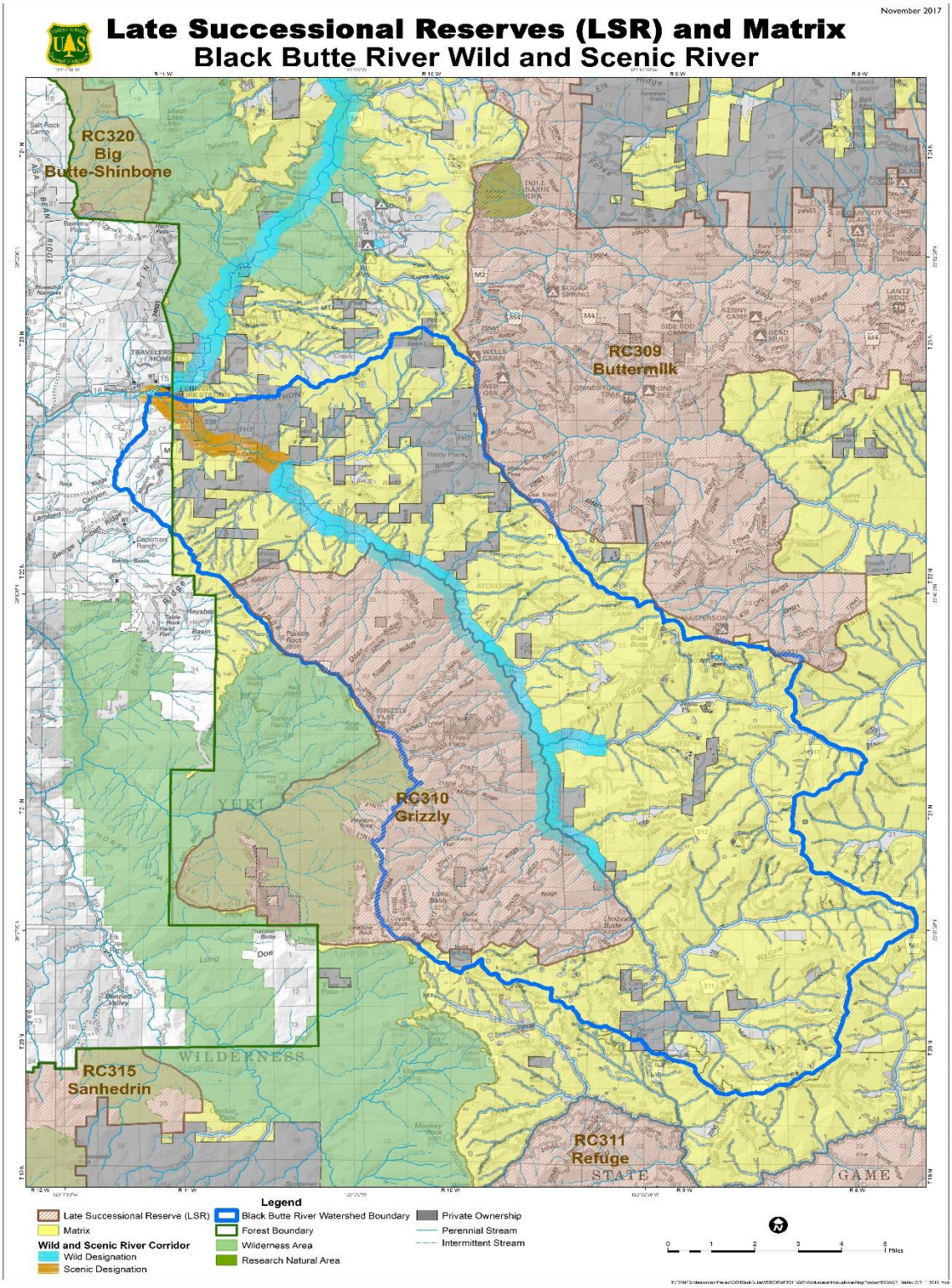



**Figure 36. Illustration of the Black Butte Watershed with the respective land allocations and ownerships depicted.**

Other impacts such as noise from harvest operations, hauling of timber on the existing road network, and smoke associated with brush disposal types of activities are a possibility within both land allocations outside of the WSR corridor. Fuels and timber projects have inconsequential outcomes, even with a non-mechanical operation, chainsaws and burning still takes place to where smoke that dispersed or noise have the potential to impact the wild and scenic portion of the watershed. Due to the sheer size of the watershed, proximity of forested vegetation where these types of activities are most likely to take place, and the fact that these types of large-scale vegetation management project occur infrequently, the expected impact to the wild and scenic river would be minimal and short-lived.

Lack of treatment within the WSR corridor allows for the onset of more shade tolerant vegetative species and structure that increases both horizontally and vertically. Forested cover types will experience an increase in shade tolerant trees such as incense-cedar, white fir, and red fir. Density levels will increase to where stands abilities to develop into mature stands with large diameter trees will be suppressed. Management activities help accelerate restoration qualities across the landscape with removal of small diameter material, increased spacing of residual trees and retention of species that are most desirable at a specific location. Treatment needs and methodologies would be assessed and analyzed at the specific project level within the watershed and, as mentioned, would have little impacts on the wild and scenic portion of the Black Butte River.